



Complete Modelling of Axles, Drivelines and Power Take-Off Units

A RomaxDesigner model provides you with a virtual transmission with all the essential engineering attributes ready for you to analyse. It seamlessly brings analysis to the concept stage where decisions are made up front in the design cycle. The combination of an intuitive user interface and expert knowledge makes RomaxDesigner the choice for transmission modelling.

Summary of perpendicular modelling capabilities:

- Modelling of non-90 degree shafts at any angle including perpendicular shafts, bearings and axles
- Bevel and hypoid gear design and rating to AGMA and Gleason™
- Gear and bearing load misalignment
- Tapered roller bearing pre-load analysis
- Integration with RomaxNVH for gear whine analysis
- Flexible housing and differential components
- Interface to Advanced Numerical Solutions (ANSol)

“RomaxDesigner is without doubt a key system for us in the conceptualisation and development of transmission systems.”

Dr. Philipsenburg,
Head of Technical Engineering,
GETRAG Ford

“The Romax Technology design and product development software is, without question, the world’s leading power transmission design tool. This advanced software tool enables our engineers to provide outstanding modelling and analysis so we can create technically superior designs in short timeframes”

Craig Winn,
President, Applied Technology Inc.

RomaxDesigner's perpendicular modelling provides you with the complete modelling of perpendicular drive systems including axle assemblies and power take-off units etc. RomaxDesigner models bevel and hypoid gear pairs, differential units and multiple bearing configurations. Full flexibility of the axle housing carrier and differential case may be considered by integrating Finite Element (FE) components.

The NVH and durability of bevel and hypoid gears in an axle system are highly sensitive to system deflection and assembly variations. In order to determine the exact working conditions of gears and bearings under load, you need to consider interactions such as gear contact and deflections of structures.

The system deflection analysis should include the housing, the differential cage, the gear blank itself as well as the shafts and the bearing pre-load.

Since its release in 1995 RomaxDesigner has become the software standard for transmission design and analysis. Our integrated approach allows you to capture all critical performance attributes within one seamless environment. This enables a paradigm shift in design efficiency, allowing companies to transform their design engineering capabilities.

Perpendicular Shaft Modeller - Key Features



Foundation module (required):

- Rolling element bearings
- Plain bearings and thrust pads
- Shafts (multiple sections)

Parallel Level 1 (required):

- Spline connections
- Concept planetary gearsets
- Belt and chain drives

Modelling of complete transmission systems including:

- Rolling element bearings
- Plain bearings and thrust pads
- Shafts (multiple sections)
- Spline connections
- Spiral and straight bevel gears
- Hypoid gears
- Differential bevel gears (Perpendicular Level 2)
- Non-90 degree shafts

Possible configurations:

- Unlimited number of parallel shafts
- Pocket/pilot bearings between shafts
- Multiple-mesh geartrains
- Rear axle differential models (Perpendicular Level 2)
- Non-parallel shaft systems

Speed and torque analysis (powerflow):

- All component loads from gearbox powerflow
- Differential power split and power recirculation (Perpendicular Level 2)

Analysis:

- Non-linear system deflection analysis
- Component duty cycle life calculations
- Mesh misalignment of gears automatically derived from system deflections
- Torsional wind-up and load sharing with split powerflow
- Spline rating to SAE guidelines and DIN
- Bearing life calculations to ISO 281 and Romax adjusted rating methods including misalignment and clearance
- Full system flexibility of housing and differential (Structural Flexibility module)

Databases:

- Integral bearing catalogues from major manufacturers
- User-definable catalogue for custom rolling bearings
- Definition of common gear materials to ISO and AGMA standards
- User-definable databases for gear and shaft materials and lubricants

Design manipulation:

- Bevel/hypoid design wizards
- 3D geometry for all components
- 'Point and click' functionality for modelling in 3D graphical user interface
- Bevel positioning tools

Optimisation and design studies:

- Bearing pre-load comparison tool

Reporting and connectivity:

- Output to printer, HTML, spreadsheet and Windows clipboard
- Animated 3D results saved directly to *.avi
- Basic shaft dimensioning

Extended modules:

- Further Bearing Analysis (DIN/ISO 281 Supplement 4)
- Advanced Radial Ball Bearing
- Advanced Cylindrical Roller Bearing
- Advanced Taper Roller Bearing
- Advanced Full Complement Needle Roller Bearing
- Advanced Thrust Needle Roller Bearing
- Advanced Four Point Contact Bearing
- Shaft Fatigue Analysis and Optimisation
- Hypoid Gear Design and Rating
- Spiral Bevel Gear Design and Rating
- Straight Bevel Gear Design and Rating
- Gear Train Transmission Error Analysis
- RomaxNVH – Gear Whine
- RomaxNVH – Component Mode Synthesis
- Housing Influence
- Structural Flexibility
- Export Bearing Element Loads to FE
- FE Solver
- CAD Export module (IGES + STEP)
- XML interface
- Romax Design of Experiments (DoE)
- ANSol interface
- Gleason concept hypoids

UK Head Office

+44 (0) 115 951 8800
sales@romaxtech.com

China

+86 (0) 571 8378 6230
romaxchina@romaxtech.com

India

+91 (0) 20 6720 1800
sales_in@romaxtech.com

France

+33 (0) 6 80 91 82 80
sales_eu@romaxtech.com

Japan

+81 (0) 3 5767 9400
sales_jp@romaxtech.com

South Korea

+82 (0) 70 7580 6210
sales_kr@romaxtech.com

North America

+1 (0) 248 250 7691
sales_us@romaxtech.com

The Romax Technology corporate logo, Romax Technology and the names of the Romax Technology software and service referred herein are trademarks or registered trademarks of Romax Technology Limited in the United Kingdom and/or other countries. © 2011 Romax Technology. All rights reserved. Part number: RXD-MB-PERP-V5-APR-11

